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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,934	03/30/2001	Tetsuya Mizuguchi	09792909-4796	8307

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SONNENSCHN NATH & ROSENTHAL LLP
P.O. BOX 061080
WACKER DRIVE STATION, SEARS TOWER
CHICAGO, IL 60606-1080

EXAMINER

DAVIS, DAVID DONALD

ART UNIT

PAPER NUMBER

2627

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/822,934

Applicant(s)

MIZUGUCHI, TETSUYA

Examiner

David D. Davis

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 8, 10-12 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Carey et al et al (US 6,452,761). As per claims 1 and 10, Carey et al et al shows in figure 7 a magnetoresistance-effect element including a magnetism-sensing section 88 the electric resistance of which changes in accordance with an external magnetic field. Carey et al et al also shows in figure 7 a low-resistance metal layer 81 contacting the magnetism-sensing section 88. Carey et al et al additionally shows in figure 7 an oxide layer 86 provided on that surface of the low-resistance metal layer 81, which faces away from the magnetism-sensing section 88.

In column 4, lines 56-58, Carey et al discloses that the low-resistance metal layer (not oxidized) has “a thickness of between 5 and 200 Angstroms (i.e. 0.5 and 20 nanometers). In the paragraph bridging columns 4 and 5, Carey et al discloses that the metal layer is then oxidized. Carey et al also shows in figure 7a a non-magnetic protective layer 82, which is not unlike layer 33 in composition, provided on that surface of the oxide layer 86 which faces away from the low-resistance metal layer 81. In column 4, lines 59-60, Carey et al discloses a non-magnetic materials use in protective layer 82. In column 5, lines 34-37 Carey et al discloses that there is a

20 % reduction in thickness after oxidization. As a result, Carey et al discloses that a total thickness of the low-resistance metal layer and oxide layer ranges from 0.5 nm to 1.5 nm.

As per claims 2 and 11, Carey et al et al discloses that the low-resistance metal layer 81 is made of copper. As per claims 3 and 12, Carey et al et al discloses that the oxide layer 86 contains material that oxidizes the element constituting the low-resistance metal layer.

As per claims 8 and 17, Carey et al et al shows in figure 7 magnetism-sensing sections 88 and nonmagnetic metal layers 82, 86 & 81 alternately laid, forming an artificial lattice film, and the low-resistance metal layer 81 contacts the outermost magnetism-sensing section 88.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-7 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carey et al (US 6,452,761). Carey et al discloses the claimed invention and in column 3, lines 5-6 Carey et al discloses that magnetism sensing section 88 is a spin-valve sensor element known in the art, which include pinned and anti-ferromagnetic layers.

Carey et al et al, however, is silent as to the oxide layer 86, the low-resistance metal layer 81, the magnetism-sensing section 88, the nonmagnetic metal layer, the pinned layer and the

anti-ferromagnetic layer are provided on a substrate, one laid upon another in the order mentioned.

Official notice is taken of the fact that spin valves with the magnetism-sensing section, the nonmagnetic metal layer, the pinned layer and the anti-ferromagnetic layer are provided on a substrate, laid upon another in the order mentioned are notoriously old and well known in the art.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the spin valve of Carey et al with the nonmagnetic metal layer, the pinned layer and the anti-ferromagnetic layer provided on a substrate, laid upon another in the order mentioned as taught in the art. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to provide a spin valve with the nonmagnetic metal layer, the pinned layer and the anti-ferromagnetic layer provided on a substrate, laid upon another in the order mentioned, which is well within the purview of a skilled artisan and absent an unobvious result, so as to effectively optimize spin valve signal.

Response to Arguments

5. Applicant's arguments filed May 30, 2006 have been fully considered but they are not persuasive. Applicant asserts in the first paragraph on page 2 that Carey "fails to disclose or suggest Applicant's claimed non-magnetic protective layer." Contrary to applicant's assertion, Carey et al shows in figure 7a a non-magnetic protective layer 82, which is not unlike layer 33 in composition, provided on that surface of the oxide layer 86 that faces away from the low-resistance metal layer 81. In column 4, lines 59-60, Carey et al disclose a non-magnetic


materials use in protective layer 82. In column 5, lines 34-37 Carey et al disclose that there is a 20 % reduction in thickness after oxidization.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Davis whose telephone number is 571-272-7572. The examiner can normally be reached on Monday thru Friday between 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne D. Bost can be reached on 571-272-7023. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


David D. Davis
Primary Examiner
Art Unit 2627

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